

# New Trends in the Surgical Management of Cervical Carcinoma

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# Global Female Cancer : Incidence & Mortality (2002)

	Incidence			Mortality		
		Crude rate	ASR		Crude Mortality Rate	ASR
Breast	<b>1151298</b>	37.4	37.4	<b>410712</b>	13.3	13.2
Cervix	<b>493243</b>	16	16.2	<b>273505</b>	8.9	9
Colorectal	<b>472687</b>	15.4	14.6	<b>250532</b>	8.1	7.6
Lung	<b>386891</b>	12.6	12.1	<b>330786</b>	10.7	10.3
Stomach	<b>330518</b>	10.7	10.4	<b>254297</b>	8.3	7.9
Ovary	<b>204499</b>	6.6	6.6	<b>124860</b>	4.1	4
Corpus uteri	<b>198783</b>	6.5	6.5	<b>50327</b>	1.6	1.6

# Cervical Cancer: Incidence & Mortality (2002)

	Incidence			Mortality		
		Crude rate	ASR		Crude Mortality Rate	ASR
World	<b>493243</b>	16	16.2	<b>273505</b>	8.9	9
Developed	<b>83437</b>	13.6	10.3	<b>39512</b>	6.4	4
Developing	<b>409404</b>	16.5	19.1	<b>233776</b>	9.5	11.2
♂Egypt	<b>2713</b>	7.8	9.7	<b>2178</b>	6.3	7.9

# Early Cancer Detection Unit Ain Shams University 1992-2006

Endometrial cancer	<b>521</b> + 34 metastatic
Cervical cancer	<b>517</b> + 111 metastatic
Ovarian cancer	<b>323</b> epithelial <b>68</b> non epithelial
Vulval cancer	<b>98</b>

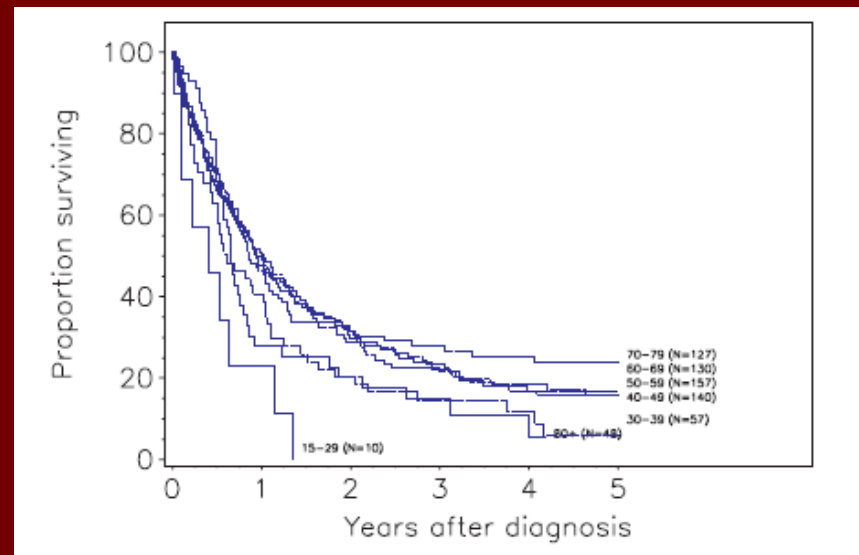
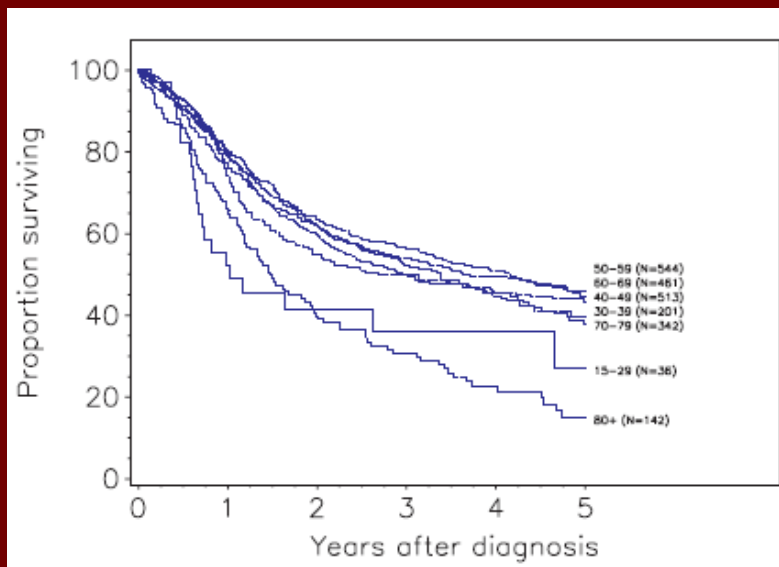
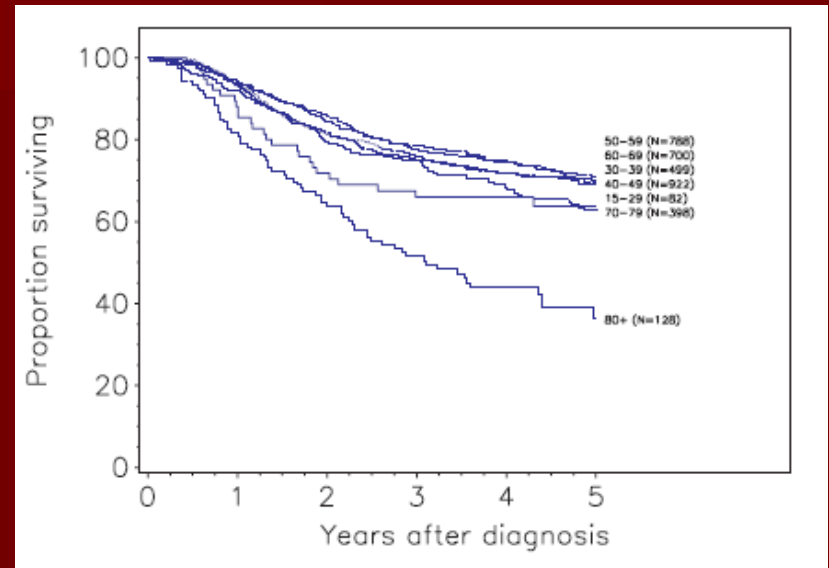
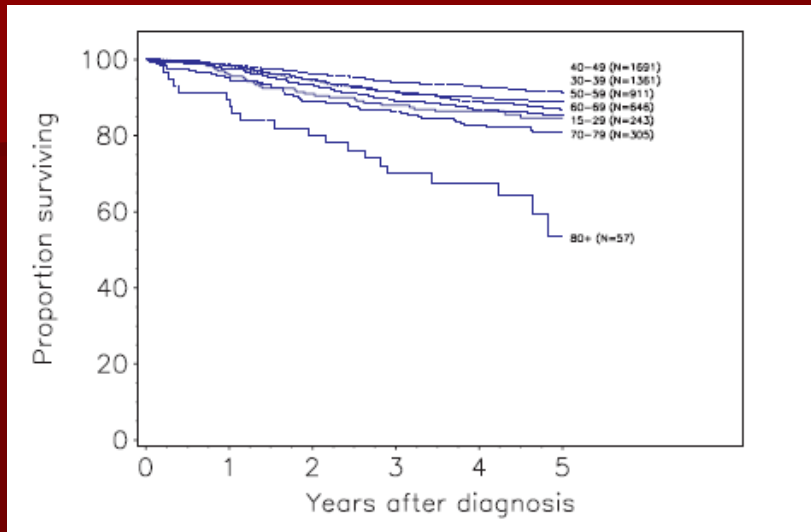


# Overall Survival (*FIGO reports 2006*)

Year	Patients	Survival (%)
1973–75	34178	55.7
1976–78	32428	55.0
1979–81	31543	53.5
1982–86	32052	59.8
1987–89	22428	65.0
1990–92	12153	65.4
1993–95	11709	72.2
1996–98	10525	69.9
1999–2001	15081	69.6
	202097	

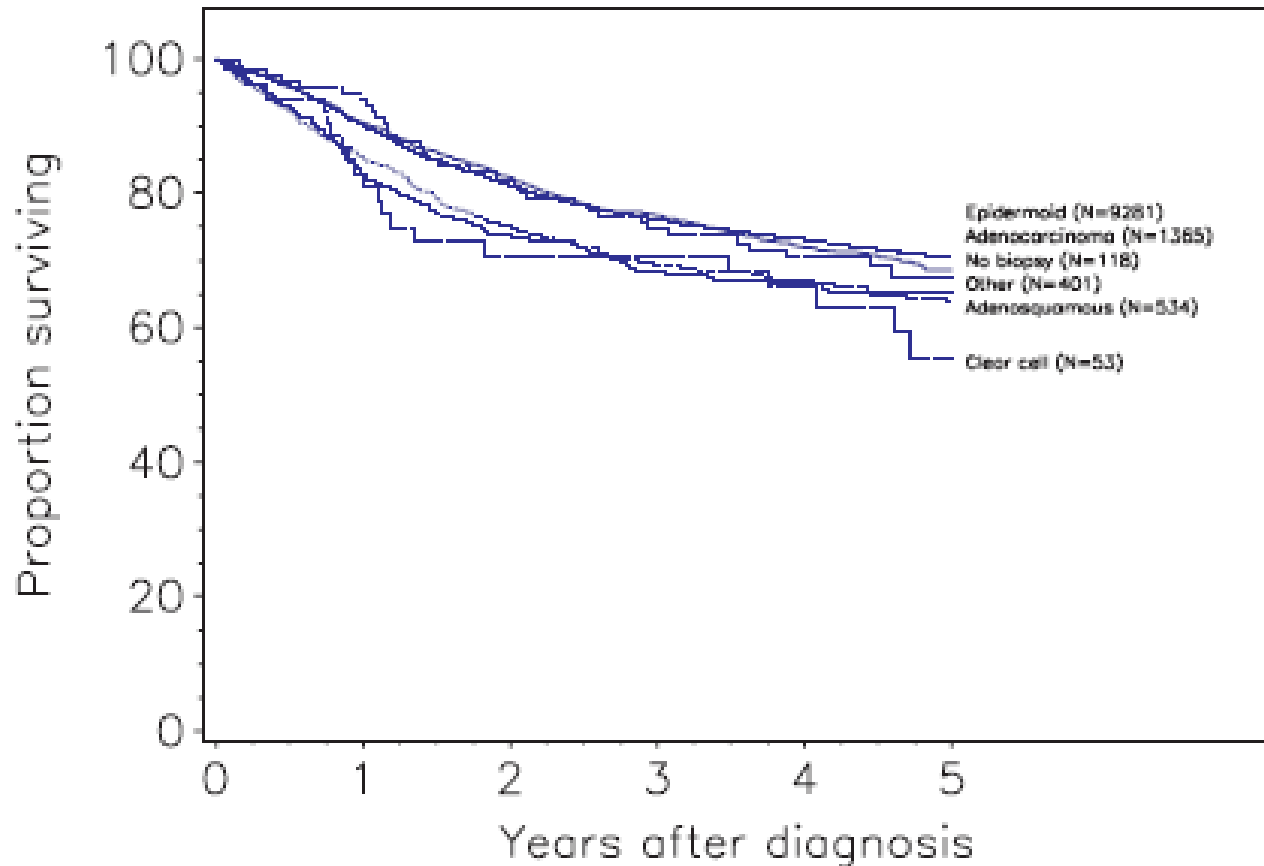
# Survival by age in various stages

*FIGO report 2006*



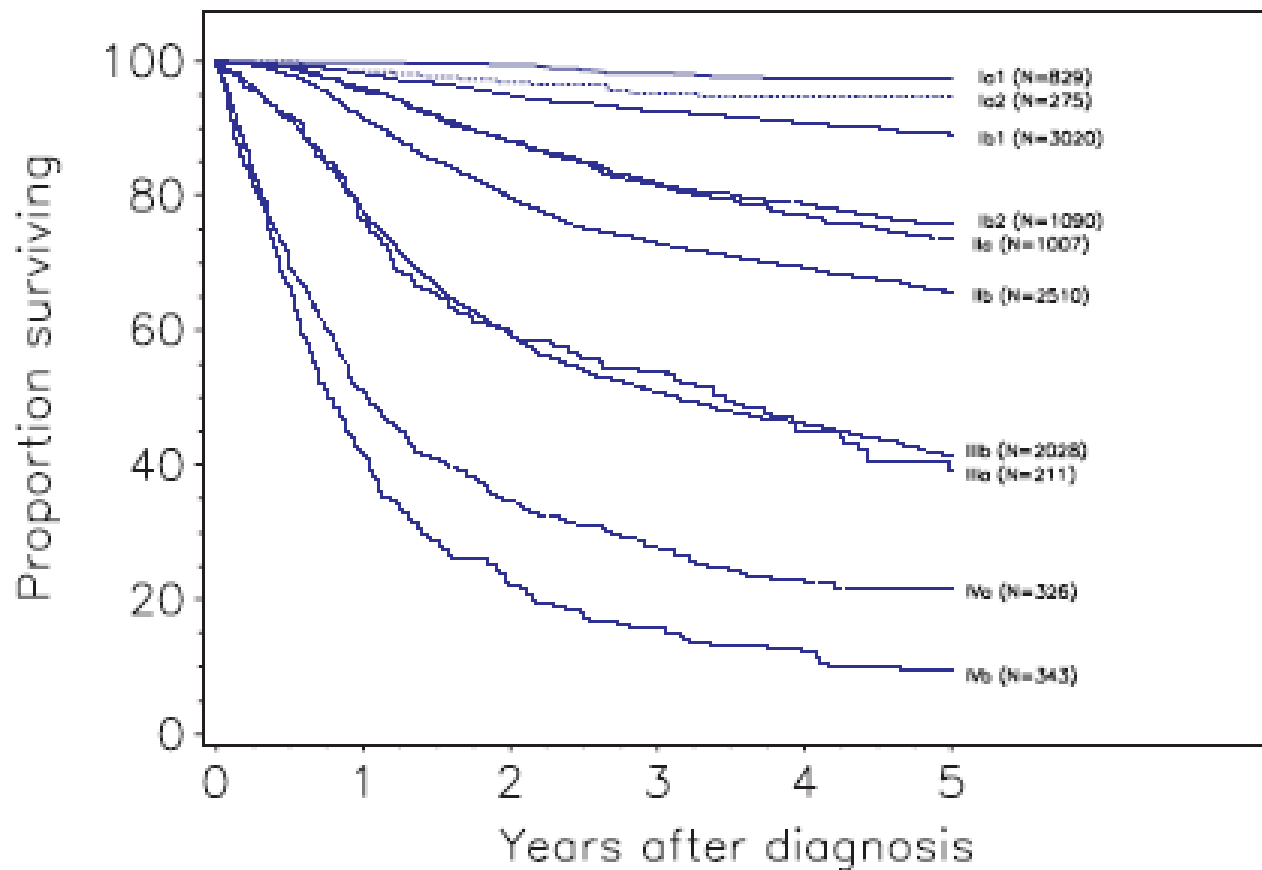
# Survival by histologic type

## *FIGO report 2006*



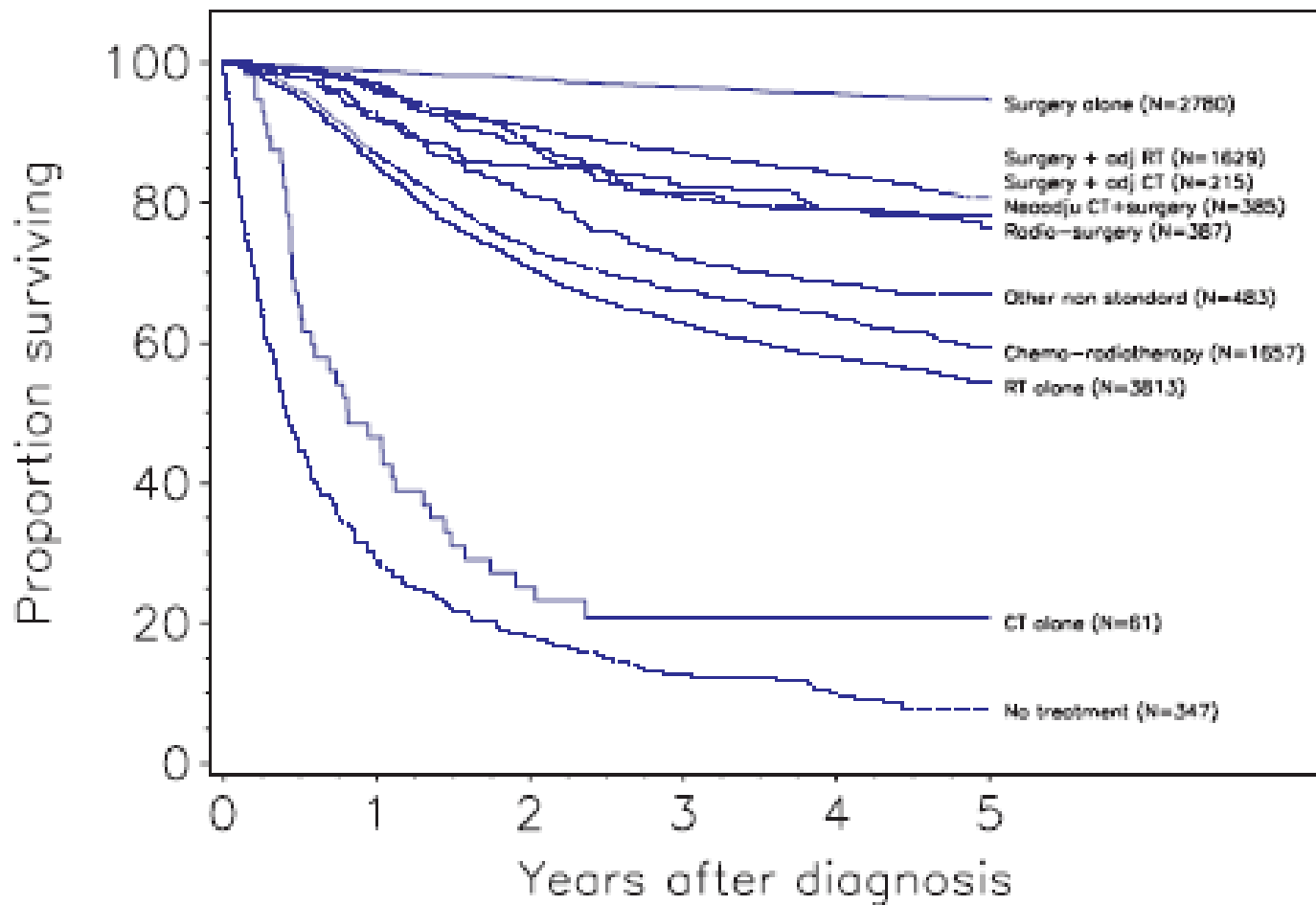
# Survival by FIGO stage

## *FIGO report 2006*



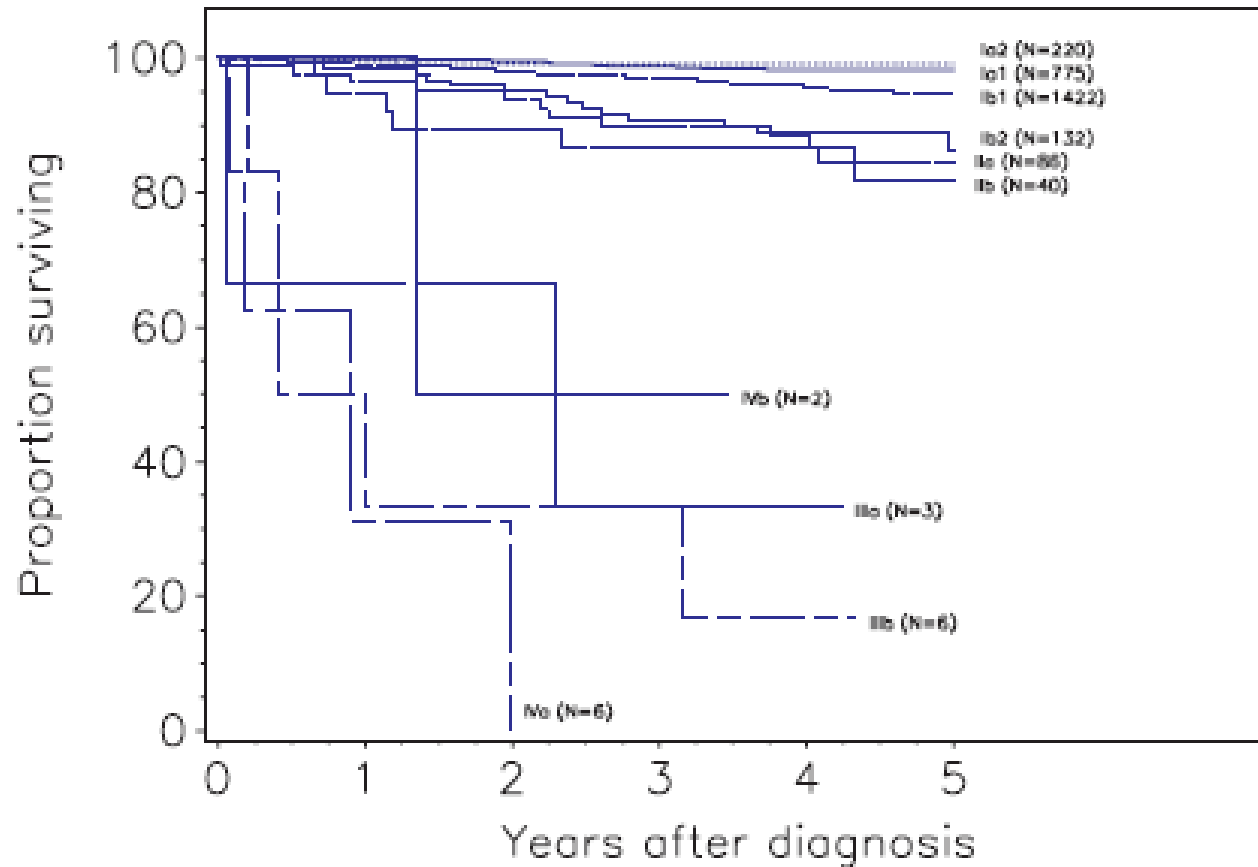
# Survival by mode of treatment

## *FIGO report 2006*



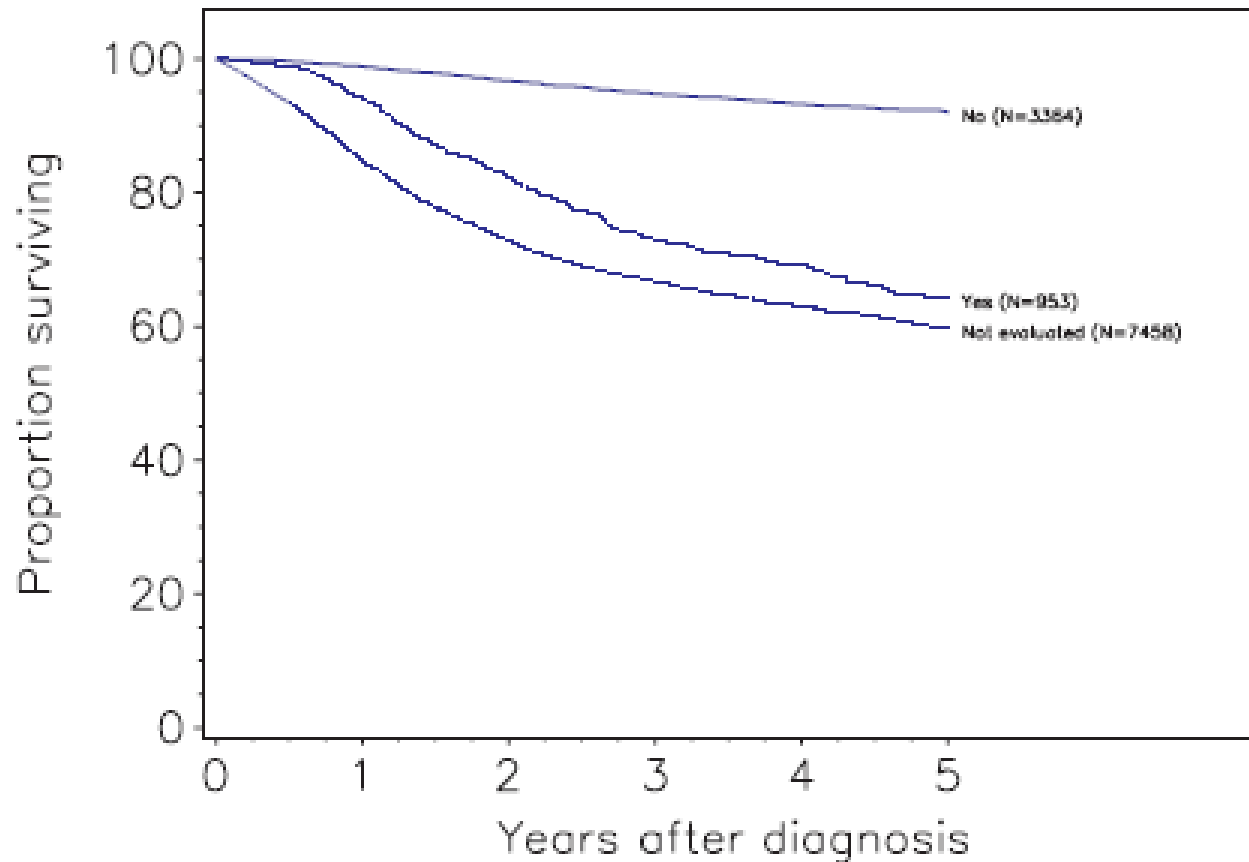
# Survival by surgery only

## *FIGO report 2006*



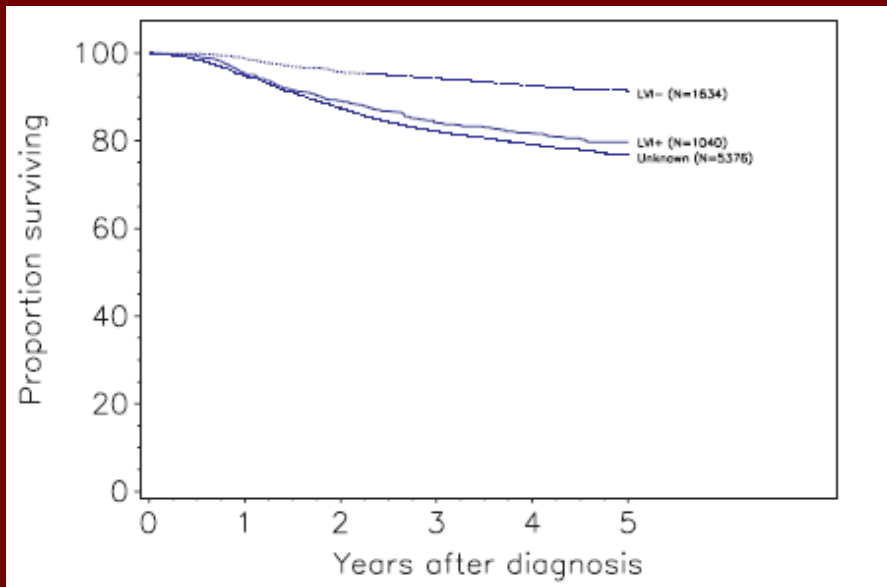
# Survival by lymph node status

## *FIGO report 2006*

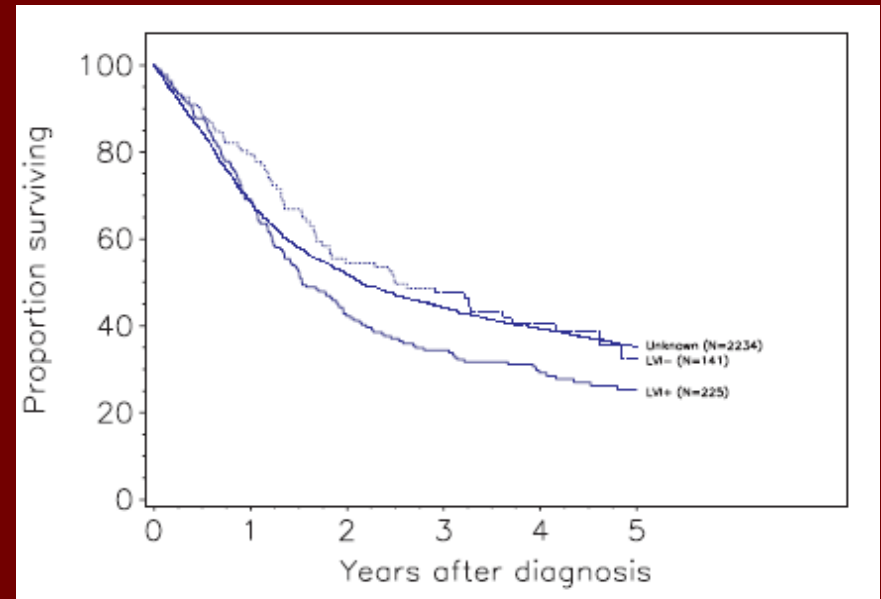


# Survival by lymph-vascular involvement (LVI)

## Stage I/II



## Stage III/IV





- A tendency for increased incidence in younger age groups has been reported (*Wu et al. 2005*)
- Treatment of cervical cancer has been essentially dependent on stage
- Successful screening programs in many western countries have resulted in significant decrease in mortality rates and improved detection at earlier stages (*Peto et al. 2004*)

# Directions and Developments

- Minimal access surgery
- More refined surgical radicality to preserve function or fertility and improve quality of life without deteriorating cure or patients' survival rates.
- A trend for surgically staging the disease for better definition of treatment options with the spreading and improved use of laparoscopy
- Down staging with neo-adjuvant chemo-therapy

# Surgical options

## ■ Fertility preserving options:

- Conization
- Radical trachelectomy
- Ovarian transposition
- Ovarian cryopreservation

## ■ Function preservation

- Sentinel node dissection
- Nerve sparing radical hysterectomy
- Mesometrial resection

## ■ Minimal access

- Laparoscopic
- Laparoscopically assisted

# Radical Trachelectomy

Vaginal  
Abdominal

# Radical Trachelectomy

- Partial trachelectomy in the elderly patient with abnormal cytology.

*Krebs et al. Obstet Gynecol. 1985 Apr;65(4):579-84*

- Radical trachelectomy *Daniel Dargent 1987, 1994*

- Abdominal radical trachelectomy *Smith et al. 1996, Rodriguez et al. 2001*

# Vaginal radical trachelectomy.

- 72 patients treated by a LPLND followed by VRT
- Stage IA2 (32%) or (60%) IB1
- Mean follow up 60 months
- 2 recurrences (2.8%) and one death (1.4%).
- The actuarial recurrence-free survival is 95%.
- Tumor size >2 cm was statistically significantly associated with a higher risk of recurrence ( $P = 0.03$ ).

*Plante M, Renaud MC, Francois H, Roy M. Gynecol Oncol. 2004 Sep;94(3):614-23.*

# Vaginal radical trachelectomy.

- A series of 50 pregnancies in 31 women
- The rate of miscarriage 20% was
- 28 (78%) delivered at term (>37 weeks)
- 2 neonatal deaths
- 7 patients (10%) had infertility problems

*Plante M, Renaud MC, Hoskins IA, Roy M. Gynecol Oncol. 2005 Jul;98(1):3-10.*



# Vaginal radical trachelectomy.

*Shepherd et al. BJOG June 2006*

- 123 women
- Follow up for of 45 months.
- 11 (8.9%) had completion treatment (2 radical hysterectomies and 9 chemoradiotherapy).
- 3 recurrences (2.7%) among the women who did not have completion treatment and 2 (18.2%) in those who did.
- 6 perioperative and 26 postoperative complications.

# Vaginal radical trachelectomy.

*Shepherd et al. BJOG June 2006*

- 63 women attempted pregnancy.
- 55 pregnancies in 26 women
- 28 live births in 19.
- 2 women had continuing pregnancies.
- The 5-year cumulative pregnancy rate among women trying to conceive was 52.8%.
- All but 2 women were delivered by classical caesarean section and 7(25.0%) babies were born at 31+6 weeks or less.

# Radical trachelectomy

- Successful pregnancy following radical trachelectomy and in vitro fertilisation with ovum donation.

*Kay TA, Renninson JN, Shepherd JH, Taylor MJ. BJOG. 2006 Aug;113(8):965-6.*

- Abdominal radical trachelectomy during pregnancy to preserve pregnancy and fertility.

**(5 cases and delivery of two healthy babies)**

*Ungar L, Smith JR, Palfalvi L, Del Priore G. Obstet Gynecol. 2006 Sep;108:811-4.*

# Radical vaginal trachelectomy (RVT)

- German Multicenter Trial (AGO)
- 108 patients (1A1, n = 18, 1A2 n = 21, 1B1 n = 69).
- 8 patients were excluded after RVT (tumor size >2 cm, neuroendocrine tumor type, tumor-involved resection margins, or positive pelvic lymph nodes).
- 100 patients were evaluable
- Median follow-up was 29 (1-128) months.
- 3 (3%) recurrences.
- The projected 5-year recurrence-free and overall survival rates were 97% and 98%.
- The average duration of surgery was 253 (115-402) min.

*Hertel et al., Gynecol Oncol. 2006 Nov;103(2):506-11*

# Neoadjuvant chemotherapy followed by vaginal radical trachelectomy in bulky stage IB1 cervical cancer: case report

- 3 young women with large cervical lesions.
- They all had lesions measuring 3 to 4 cm and felt to be too big to safely undergo a radical trachelectomy

*Plante et al., Gynecol Oncol. 2006 May;101(2):367-70.*

# Radical trachelectomy

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# Ovarian conservation

Ovarian transposition

Ovarian cryopreservation

# Ovarian transposition

- Lateral ovarian transposition. Ovarian relocation in patients with Hodgkin's disease. *Nahhas et al. Obstet Gynecol. 1971 Nov;38(5):785-8.*
- Transposition of the ovaries for function preservation in radical surgery and post-irradiation of cervical carcinoma *Bilek & Leitsmann 1984*
- Heterotopic ovarian auto-transplantation *Muller et al. 1988*



# Ovarian transposition

- Can be achieved laparoscopically
- Loss of function 17-50%
- Symptomatic ovarian cysts 24% (3 fold rise)  
*Chambers et al. 1990*
- Ovarian metastasis on transposed ovary
  - This procedure should not be performed in patients with bulky tumor and/or in patients with LVSI.

*Morice et al. Gynecol Oncol. 2001 Dec;83(3):605-7*

# Ovarian transplantation

Tamara the first  
child born  
after ovarian  
transplant  
2004



# Ovarian transplantation

- Live birth after orthotopic transplantation of cryopreserved ovarian tissue.

*Donnez et al. Lancet. 2004 Oct 16-22;364(9443):1405-10.*

- Ovarian transplantation between monozygotic twins discordant for premature ovarian failure

*Silber et al. NEJM July 2005; 353:58-63 .*

- Pregnancy after transplantation of cryopreserved ovarian tissue in a patient with ovarian failure after chemotherapy.

*Meirow et al. NEJM. 2005 Jul 21;353(3):318-21. 2005*

# Ovarian cryopreservation

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Donnez et al. Lancet. 2004 Oct 16-22;364(9443):1405-10.  
van Langendonckt A.

- Ovarian transplantation between monozygotic twins discordant for premature ovarian failure

*Sherman et al. NEJM July 2005; 353:58-63 .*

# Ovarian cryopreservation

- It is unavoidable now to discuss the matter of future fertility in women having cervical cancer in their reproductive years
- Gynaecological oncology centers should make arrangements for these surgical options possible

# Function preservation

Nerve sparing radical hysterectomy

Mesometrial resection

Sentinel node dissection

## **Appropriate management plans would consider:**

- Preservation of body image
- Avoidance of crippling therapy complications
- Maintaining feminine integrity & sexual function
- Minimizing institutionalisation & hospital stay
- Reasonable consideration of women's wishes and views

# Nerve sparing radical hysterectomy

## **Pelvic autonomic nervous system:**

### **1. Hypogastric nerves** (sympathetic)

*Bladder compliance, urinary continence, small muscle contraction during orgasm*

### **2. Pelvic splanchnic nerves** (parasympathetic S2-4)

*Detrusor contractility, rectal functions, vaginal lubrication & genital swelling during arousal*



# Nerve sparing radical hysterectomy

Radical hysterectomy results in bladder denervation which is more sympathetic than parasympathetic leading to:

- Detrusor hypertonus
- Uninhibited detrusor contractions
- Bladder desensitization to filling (63% at 1 year)
- Decreased bladder compliance (two thirds)
- Voiding difficulty (85%)

*(Forney et al., 1987, Ralph et al.; 1988)*

# Nerve sparing radical hysterectomy

The concept of **nerve sparing radical surgery** has been known for decades

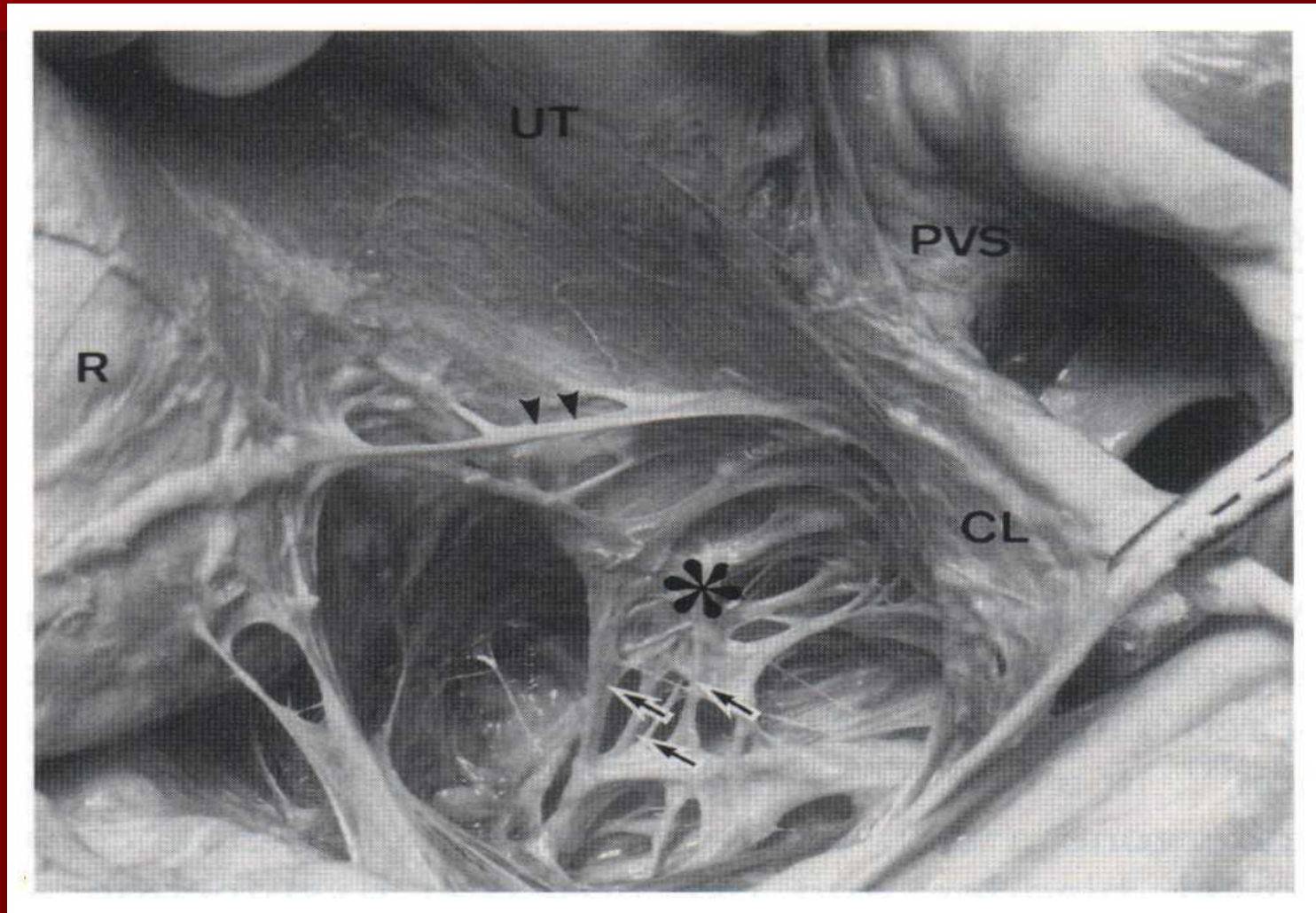
among the Japanese in the treatment of uterine cancer (Tokyo technique)

&

among colorectal surgeons in the treatment of rectal cancer

**without compromising outcomes**

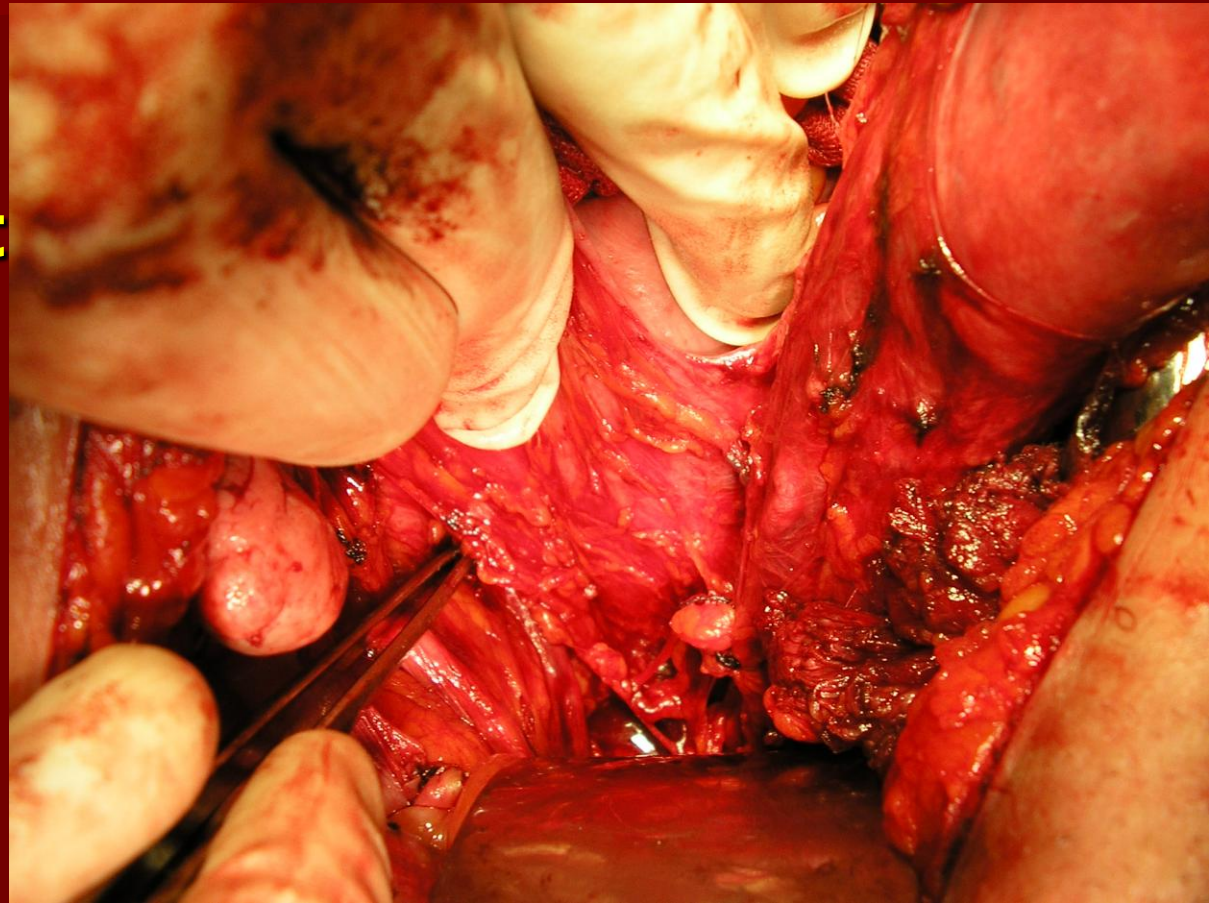
# Nerve sparing radical hysterectomy



# Nerve sparing radical hysterectomy

## **Ain Shams Gynecologic Oncology Unit**

- 4 patients
- Obesity is an obstacle
- Prolonged bladder recovery in 2



# Total Mesometrial Resection

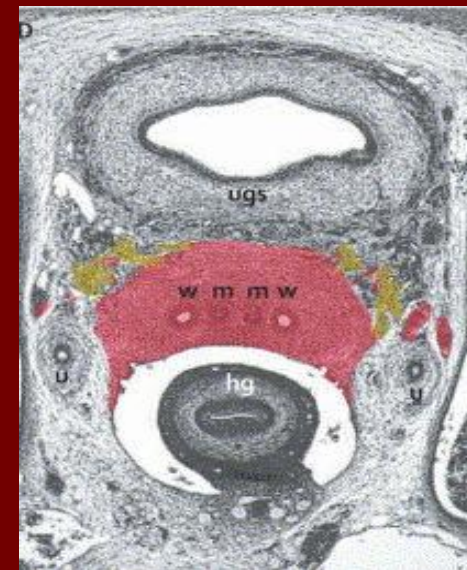
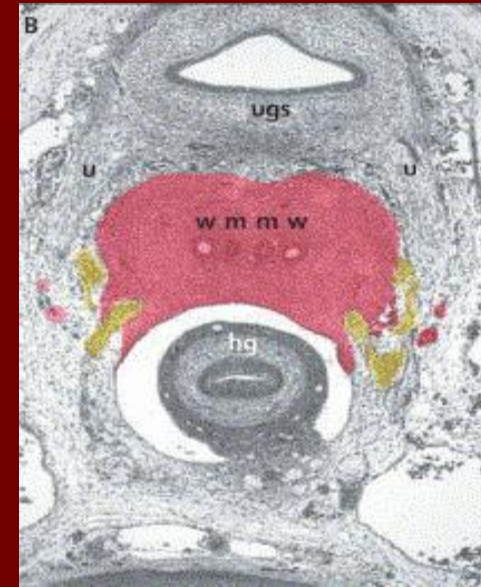
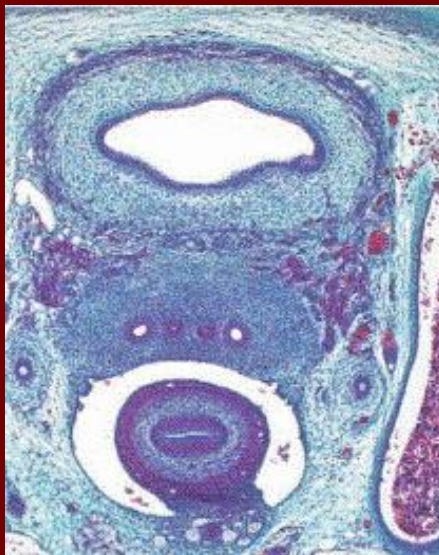
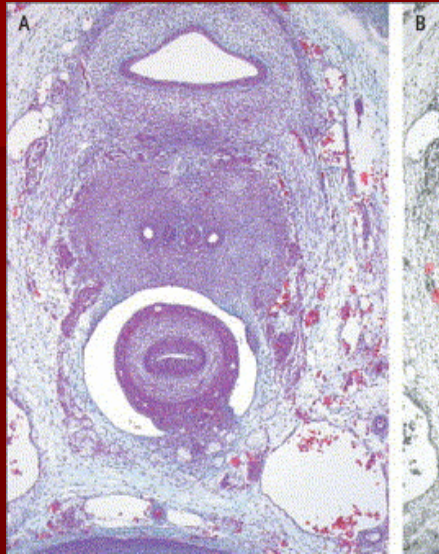
*Hockel et al. The Lancet Sept 8 2005*

Macroscopic, microscopic, and occult local tumour spread might be restricted to a permissive territory related to the morphogenesis of the tissue or organ from which the tumour originates.



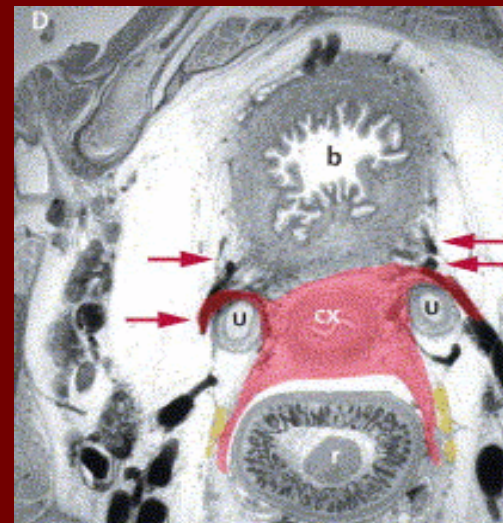
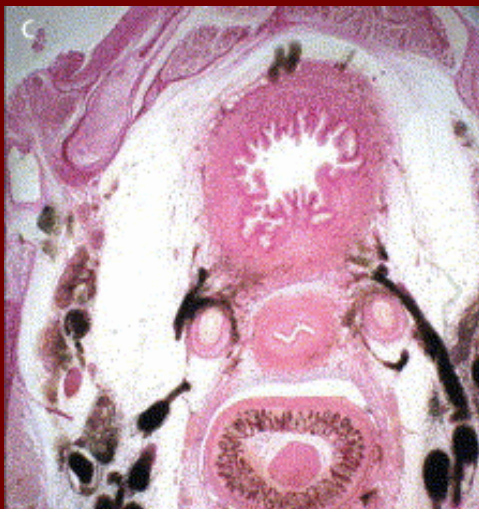
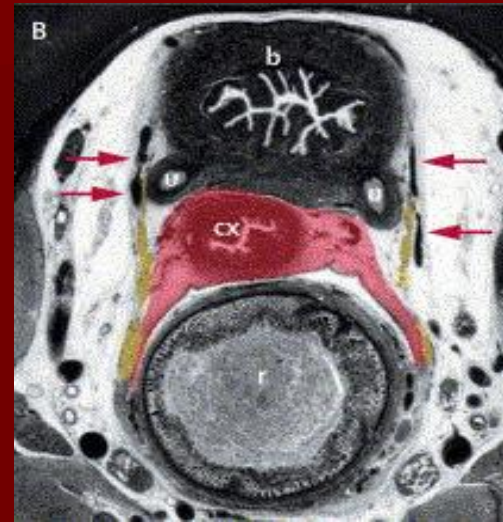
# Total mesometrial resection

*Hockel et al. The Lancet Sept 8 2005*



# Total mesometrial resection

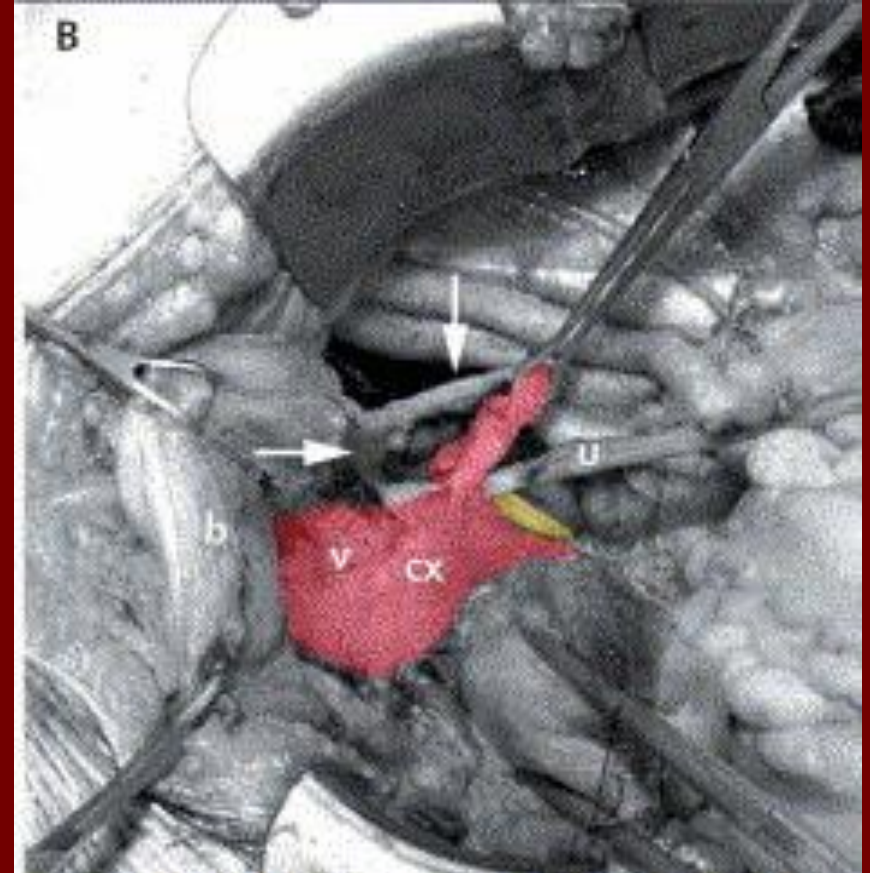
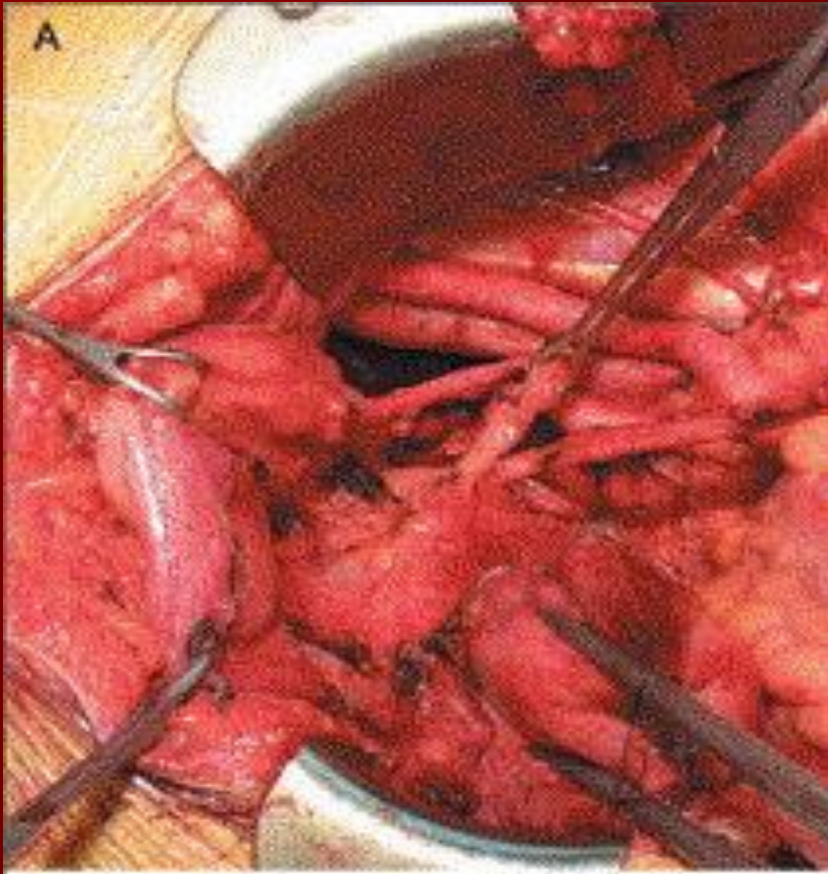
*Hockel et al. The Lancet Sept 8 2005*





# Total Mesometrial Resection

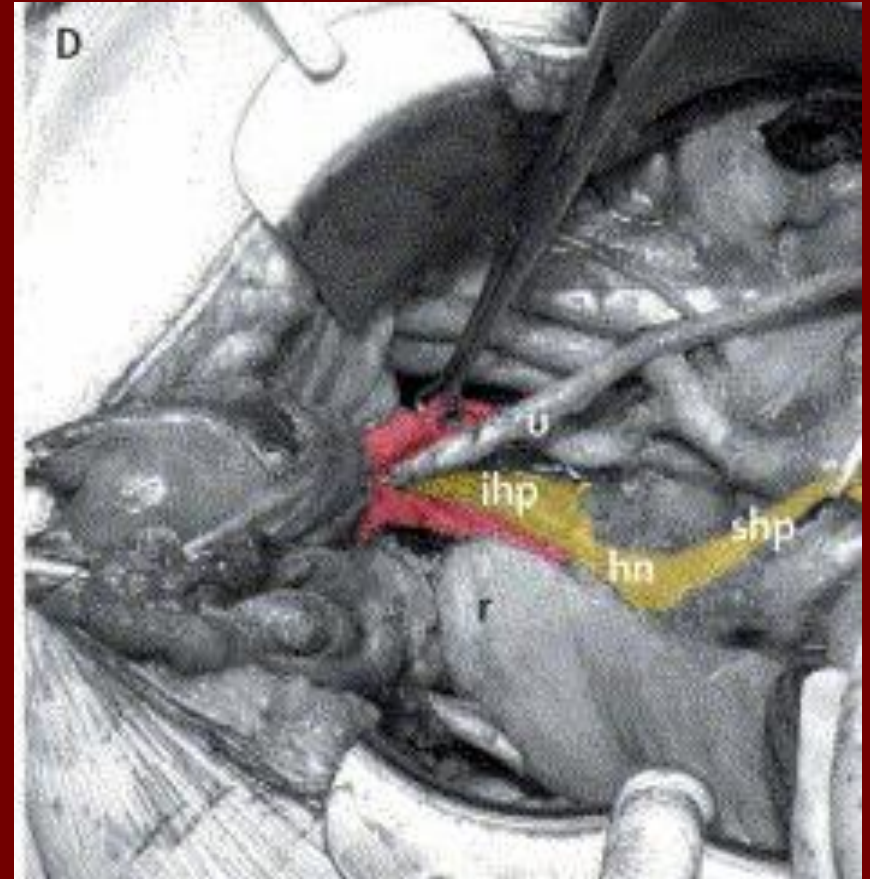
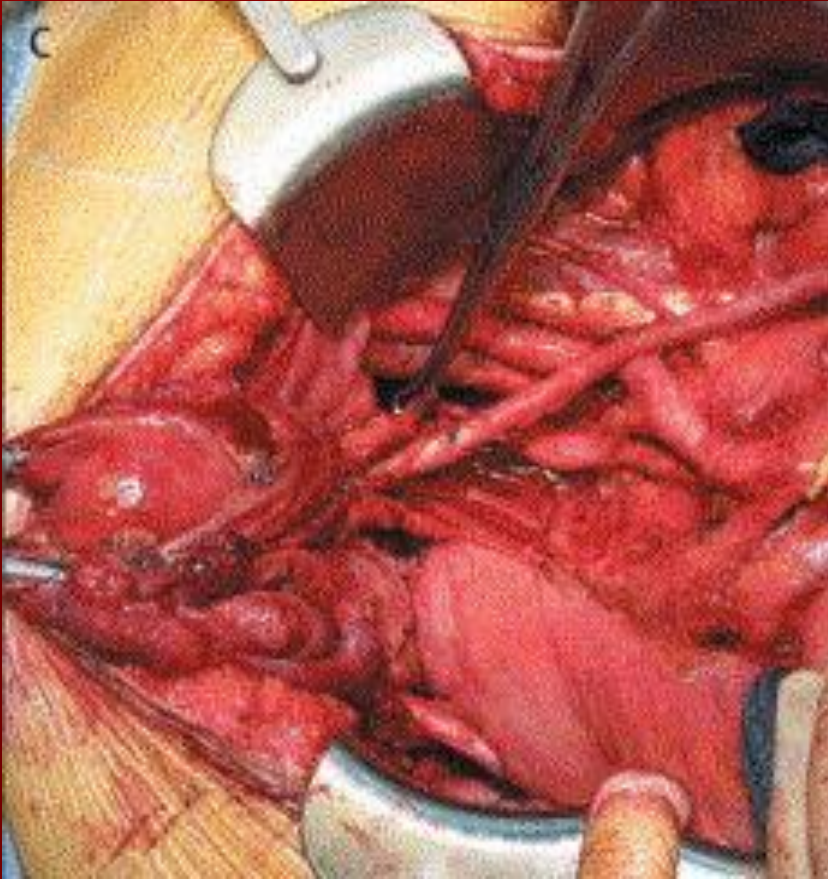
*Hockel et al. The Lancet Sept 8 2005*





# Total Mesometrial Resection

*Hockel et al. The Lancet Sept 8 2005*



# Total Mesometrial Resection

*Hockel et al. The Lancet Sept 8 2005*

- Identified morphogenetic unit through which cancer cells spread.
- 105 of 106 had total mesometrial resection had microscopically tumour-free resection margins
- 48 (96%) of 50 patients had pelvic recurrence-free survival at 3 years (95% CI 92–100)

# Sentinel node dissection in cervical cancer

- Blue dye or Technetium-99m-labeled colloid

- Feasible

Dargent et al. 2000 (35 patients)

van Dam et al. 2003 (25 patients)

Di Stefano et al. 2005 (45 patients)

Rob et al. 2007 (26 patients)

# Sentinel node dissection in cervical cancer

- Conflicting efficiency

Cytokeratin immuno-histochemistry may identify lymph node micro-metastases in non-sentinel lymph nodes even when sentinel lymph nodes were found to be negative for disease on biopsy (NPV 87.5%)

*Marchiolo et al. Cancer. 2004 May 15;100(10):2154-9.*

# Laparoscopic sentinel lymph nodes identification followed by trachelectomy

- Laparoscopic sentinel lymph nodes identification followed by trachelectomy in early stage cervical cancer (one case)

*Barwijk AJ, Gawlak M. Ginekol Pol. 2006 Jul;77(7):550-4.*

# Less radical fertility-sparing surgery than radical trachelectomy in early cervical cancer

- 26 patients (6-IA2, 20-IB1)
- laparoscopic lymphadenectomy with sentinel lymph node identification (SLNI) followed by large cone or simple trachelectomy after 7 days in node negative
- No false negative SLNI
- 15 women planned pregnancy
- 11 women became pregnant (15 pregnancies)
- 7 women delivered eight children (3 (43%) preterm)

*Rob L, Charvat M, Robova H, Pluta M, Strnad P, Hrehorcak M, Skapa P. Int J Gynecol Cancer. 2007 Jan-Feb;17(1):304-10*



# Minimal access

Laparoscopic procedures

Laparoscopically assisted procedures

# Laparoscopic procedures

- Laparoscopic-assisted vaginal radical hysterectomy (LARVH) *Dargent et al. 1995 Roy et al. 2005*
- Total laparoscopic radical parametrectomy (TLRP) *Lee and Huang 2005*
- Total laparoscopic radical hysterectomy *Gil-Moreno et al. 2005*
- Laparoscopic trachelectomy
- Laparoscopic pretreatment surgical staging *Chang et al. 2005*



# Laparoscopic procedures

- High level skill requirements
- Port metastases
- The feasibility is established from cohort or case-control.
- The absence of large phase III studies

# Conclusion

- Surgical management of cervical carcinoma is witnessing a diverse evolution of a more refined and precise radicality with valid and viable options to preserve reproductive capacities.
- This entails better patient counseling and more collaborative multi disciplinary approaches in planning management.

# Conclusion

- Of course there is a great demand for training to acquire skills necessary to efficiently perform of these evolving surgical techniques.
- Effectiveness of new techniques needs to be appropriately evaluated through RCT

# Thank You

